THE HOME COMPUTER COURSE

Designed and produced by Bunch Partworks Ltd
Published by Orbis Publishing Ltd
20-22 Bedfordbury London WC2N 4BT
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Printed in Great Britain

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LONDON

Introduction

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The explosive growth of the home computer market has been one of the most remarkable phenomena of recent years. The United Kingdom now leads the world in the sheer numbers of home computers owned in proportion to the population, as the dozens of magazines aimed at users testify. A satisfying feature of this new market is the major share taken by products of British origin, such as the BBC Microcomputer and the Sinclair ZX81 and Spectrum.

Many home computer users are interested mainly or exclusively in computer games, and the provision of games programs, or 'software', is another lucrative industry that has sprung up to meet their needs. It is understandable that, among those who are not attracted to playing computer games, a certain amount of scepticism should arise as to whether the computer can serve any real purpose in the home. Some of the uses suggested by enterprising salesmen — such as generating dinner menus or improving your ability to win at horse racing — might seem to justify such suspicions. Is home computing no more than a passing craze, destined to go the way of skateboarding and the Rubik cube? I shall suggest some reasons why this is not so: why home computers should be regarded as much more than just games-playing machines and why some familiarity with their capabilities, their internal workings and their probable future evolution is enormously important.

Many home computer owners value their machines simply for the enjoyment and fascination that they offer. Questions of their cost-effectiveness and usefulness are as irrelevant to such enthusiasts as they would be to any other hobbyist. These users do not need to be persuaded of the benefits of systematic knowledge such as The Home Computer Course can offer; they know that learning more about both hardware and software will help them to enhance their computers, to link their machines to a growing range of peripheral equipment and to help them in creating their own new or improved software.

But for the many owners, actual and potential, of home computers who do not feel attracted to computing as an interesting hobby, there are also compelling reasons for acquiring an understanding of the principles of the computer.

Developments in microelectronic technology follow each other at an unprecedented rate. They are leading inevitably to the spread of microchip-based products and computer techniques into all aspects of our lives. Our society is becoming increasingly dependent on computers and their software for its prosperity, health and defence. Short of a natural or man-made catastrophe, information technology will not go away. Understanding of computers is therefore directly relevant to general as

much as to vocational education. Indeed, it is obvious that many parents are purchasing home computers for this very reason — they believe that they can thus give their children a competitive edge over their schoolmates.

It is often argued that people do not need to understand how computers work in order to use them adequately — just as, it is said, car drivers do not need to know how a car works, and no one needs to acquire skill in mental arithmetic now that pocket calculators are cheap and plentiful. But there are several reasons why this view is inadequate, and why a broadly based understanding of computers is of great importance for the future. First, it can remove the fear of computers that arises from ignorance, and so permit people to begin to distinguish between what is possible and what is impossible for a computer. And this permits some genuine risks of computers to be recognised — for example, in using computer software to control medical care or nuclear power stations. Second, such education may prevent the creation of two new classes of citizen: a majority lacking understanding of computer technology, vulnerable to bureaucratic control and even oppression, and a minority of experts — latter-day witch doctors exercising control by imposing a heavy burden of fear and superstition on a hapless tribe. Computers have the potential to facilitate oppression — but a 'computer-literate' population able to develop the tools to protect themselves seems the best defence against a computer-assisted totalitarian government. Perhaps this is more important than the possibility (or even probability) that a significant proportion of such a population will engage in computer-assisted crime or accidentally plug into the NATO computer network. Third, from a more directly practical point of view, our future prosperity may depend on computer literacy as the success of the Industrial Revolution and the administration of the British Empire depended on the nation's knowledge of the 'three Rs'.

But the value of owning and learning about the computer is not wholly a matter of theory. After an initial period in which the novice grapples with the foibles and limitations of an inexpensive home computer, he or she will realise that it can be the basis of a useful and cost-effective system. Small businesses throughout the country are using cheap microcomputers to prepare their accounts, manage their stocks, and handle their records. The same businesses, together with writers and private householders, are using computers in word processing systems — that is, as 'intelligent typewriters'. Such applications require investment in accessory equipment, such as disk drives and printers, as well as professionally produced programs. That is why these items figure in The

Home Computer Course almost as prominently as the computers themselves.

Most home computer owners use BASIC, by far the most popular programming language because of the ease with which it can be learned. A complete course in BASIC, in 24 parts, runs through The Home Computer Course. But computer literacy demands some appreciation of other programming languages, such as PASCAL or LOGO, which is intended especially for educating children. That is why, in these pages, you will find attention paid to some of these other languages, of which there are hundreds.

In the future there will almost certainly be an increased use of 'program generators' and very high-level languages, both of which make it easier for the user to convey his requirements to the computer. Functional languages will enable us to tell a computer what to do rather than, as at present, telling it how to do the task. And computers will become 'expert systems', sources not only of factual information but also of advice.

Remarkable and fascinating though they are, today's personal computers are primitive in comparison with what will soon be available. We cannot make reliable predictions for more than a few years ahead, but those who become deeply involved with the present generation of home computers will be well placed to understand future developments.

Some of those who work assiduously at learning to program their own computers are motivated by a wish to enter the computing profession. This is a reasonable aim, but it must be kept in perspective. Those who complete the Basic Programming Course in this work will have some appreciation of the gulf between writing programs for home use and designing software of professional quality for serious business applications. You would not expect someone who had built a successful model aircraft from balsa wood to be entrusted with the design of a supersonic airliner, and there is at least as great a gap between the hobbyist who can make money from developing a new game and a software engineer who can earn a living in industry.

Of all human artefacts, the digital computer is unique in its flexibility. Its capabilities are completely determined by the programs that control it, and their scope is limited only by the creativity and ingenuity of the program designers. To master the computer calls for equal flexibility in human beings. The advent of the home computer can be expected to promote the necessary adaptations in the population at large and to spur school students towards careers in 'information engineering'. This is a healthy trend, and one that is necessary for our economic survival. The Home Computer Course will contribute to these developments.

Getting the best from your Home Computer Course

This is the first comprehensive guide to the world of home computers, designed to help you make the most of your machine. It is divided into a number of parallel study 'streams'; to make it easy to follow one stream through from the beginning to the end of the work, each has been allocated a distinctive coloured stripe, which runs right across the head of the page and can be spotted at once as the pages are riffled through.

It may be that you are still trying to make up your mind before buying your first computer, and find it difficult to disentangle the manufacturers' sweeping claims from the necessary basic specification; or perhaps you have been baffled by the ill-digested jargon hurled at you by the salesman in your High Street shop. On the other hand, you may be looking for a more up-to-date, more powerful machine to replace your present model. In either case, HARDWARE FOCUS is for you. We take a penetrating look at all the popular micros in turn, removing the cover and keyboard to look at the interior layout, providing a rationally tabulated list of specifications that makes it simple to compare one machine with another, and detailing the various peripherals available.

Once you have your computer, you'll immediately want to try it out and discover what it can do. The course in BASIC PROGRAMMING begins by showing you what a computer cannot do — you can write a simple program for it that will force it to make mistakes, and it will have no means of correcting them. From this point on we take you through exercises of increasing complexity, at the end of which you should have a complete understanding of programming in Microsoft BASIC.

What's going on inside the computer as you write your programs? PASSWORDS TO COMPUTING helps you to understand the inner workings of your micro, explaining electronic logic and how it is applied in computer design. And as you develop more sophisticated skills, SOUND AND LIGHT leads you through the complexities of generating music, sound effects and graphics in the most popular micros.

Then there are the peripherals: disk drives and printers, joysticks and modems. The aptly-named INSIGHTS stream lets you look into the interiors of these machines, revealing the details of their mechanical construction and explaining the electronics that govern them.

And, of course, SOFTWARE has not been forgotten. This stream does not only review the most outstanding of the fascinating range of programs commercially available; it also outlines the principles upon which the programs are written and looks into the many external facilities that can be accessed. And to round out your understanding of how computers have developed we introduce you to the achievements of some PIONEERS IN COMPUTING. Welcome to The Home Computer Course—the future starts here!